Fiscal Year:	FY 2004	**Task Last Updated:**	FY 03/30/2006
PI Name:	Wood, Scott J. Ph.D.		
Project Title:	Sensorimotor adaptation following exposure to ambiguous inertial motion cues		
Division Name:	Human Research		
Program/Discipline:	NSBRI Teams		
Program/Discipline--Element/Subdiscipline:	NSBRI Teams--Neurovestibular Adaptation Team		
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	(1) **HHC**:Human Health Countermeasures		
Human Research Program Risks:	(1) **Sensorimotor**:Risk of Altered Sensorimotor/Vestibular Function Impacting Critical Mission Tasks		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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City:	Houston	**State:**	TX
Zip Code:	77058	**Congressional District:**	36
Comments:	NOTE: PI returned to NASA JSC in January 2017. PI was at Azusa Pacific University from August 2013 – January 2017; prior to August 2013, PI was at NASA JSC.		
Project Type:	GROUND	**Solicitation / Funding Source:**	2003 Biomedical Research & Countermeasures 03-OBPR-04
Start Date:	09/01/2004	**End Date:**	08/31/2008
No. of Post Docs:		**No. of PhD Degrees:**	
No. of PhD Candidates:		**No. of Master' Degrees:**	
No. of Master's Candidates:		**No. of Bachelor's Degrees:**	
No. of Bachelor's Candidates:		**Monitoring Center:**	NSBRI
Contact Monitor:		**Contact Phone:**	
Contact Email:			
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):			
Grant/Contract No.:	NCC 9-58-NA00405		
Performance Goal No.:			
Performance Goal Text:			
Task Description:	The central nervous system must resolve the ambiguity of inertial motion sensory cues in order to derive an accurate representation of spatial orientation. Previous studies suggest that both frequency segregation and multi-sensory integration are complementary strategies used for discriminating linear accelerations arising from tilt and translation head motion. Adaptive changes during space flight in how inertial cues from the otolith system are integrated with other sensory information lead to perceptual and postural disturbances upon return to Earth's gravity. We hypothesize that multi-sensory integration will be adaptively optimized in altered gravity environments based on the dynamics of other sensory information available, with greater changes in otolith-mediated responses in the mid-frequency range where there is a crossover of tilt and translational otolith-mediated responses. The first phase of our experiments is designed to elucidate physiological mechanisms for re-entry disturbances, and to develop a ground-based adaptation model for		

Task Description:	evaluating adverse operational implications of tilt-translation adaptation. The first specific aim of this proposal will be to examine the effects of stimulus frequency and different patterns of inertial sensory cues on adaptive changes in eye movements and motion perception during combined tilt and translational motion profiles. For our second specific aim, we will employ a closed-loop nulling task in which subjects will be tasked to use a joystick to null out tilt motion disturbances with or without concomitant translational motion. Our final specific aim is to evaluate how a tactile prosthesis can be used to improve control performance. The results of this study will contribute to refining the ability of the tactile prosthesis to improve spatial orientation and navigation and serve as a countermeasure for tilt-translational disturbances during and following G-level changes.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New grant in FY2004; no progress report this period.
Bibliography Type:	Description: (Last Updated: 03/08/2024)